

**IN UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF TENNESSEE
NASHVILLE DIVISION**

AIA ENGINEERING LIMITED)
)
Plaintiff/Counterclaim Defendant,)
)
v.)
)
MAGOTTEAUX INTERNATIONAL SIA)
and MAGOTTEAUX, INC.)
)
Defendant/Counterclaim)
Plaintiffs)
_____)
)
MAGOTTEAUX INTERNATIONAL S/A)
And MAGOTTEAUX, INC.)
)
Third Party Plaintiffs,)
)
v.)
)
VEGA INDUSTRIES, LTD., INC.)
)
Third Party Defendant.)

NO. 3:09-00255
JUDGE HAYNES

MEMORANDUM

Plaintiff, AIA Engineering Limited (“AIA”), an India corporation, filed this action under 28 U.S.C. § 2201, et seq., the declaratory judgment statutes against the Defendants: Magotteaux International S/A, a Belgian corporation and Magotteaux, Inc., an affiliated Tennessee corporation (“Magotteaux”). AIA seeks a declaratory judgment that its products do not infringe Magotteaux’s U.S. Patent No. RE 39,998 (the “998 patent”), a reissue patent based upon Magotteaux’s earlier U.S. Patent No. 6,399,176 B1 (the “176 patent”) as well as a declaration of the invalidity and unenforceability of the ‘998 patent. AIA’s claims arise under the patent laws of the United States, 35 U. S. C. § 101 et seq. with subject matter jurisdiction under 28 U.S.C. §§

1331 and 1338(a). In response to Plaintiff's action, Magotteaux filed a third party complaint for patent infringement against AIA and Vega Industries, LTD, an AIA subsidiary with its principal place of business in Brentwood, Tennessee that sells and distributes AIA's products in the United States.

Before the Court are AIA's motions for summary judgment on its challenges to Magotteaux's patent reissue contending, in sum: (1) that in its '998 patent, Magotteaux improperly recaptured claims surrendered in its '176 patent (Docket Entry Nos. 88 and 97); (2) that Magotteaux cannot recover damages in this action for AIA's sales of its non-infringing product in foreign countries (Docket Entry No. 100); (3) that AIA's products do not infringe Magotteaux's '998 patent (Docket Entry No. 116); (4) that Magotteaux's '998 patent is invalid as obvious from prior art (Docket Entry No. 118); and (5) that the public use of Magotteaux's product more than a year prior to its '998 patent application precludes the enforceability of that patent. (Docket Entry No. 120). These motions are interrelated to the parties' briefs on the Markman¹ issues and hearing on the appropriate construction of the terms "homogeneous solid solution," "homogeneous ceramic composite," "consisting of" and "comprising" in claims 1 and 12 of Magotteaux's '176 and '998 patents. (Docket Entry Nos. 50, 52, 53, 61, 62 and 63).

A. Findings of Fact²

¹ Markman v. Westview Instruments, Inc., 517 U.S. 372 (1996).

² Upon a motion for summary judgment, the factual contentions are viewed in the light most favorable to the party opposing the motion for summary judgment. Duchon v. Cajon Co., 791 F.2d 43, 46 (6th Cir. 1986). As discussed infra, upon the filing of a motion for summary judgment, the opposing party must come forth with sufficient evidence to withstand a motion for directed verdict, Anderson v. Liberty Lobby, 477 U.S. 242, 247-52 (1986), particularly where there has been an opportunity for discovery. Celotex Corp. v. Catrett, 477 U.S. 317, 326 (1986). The Court concludes that under the applicable law, there are not any material factual disputes on the Markman and recapture issues. Yet, with the conflicting expert reports and the technical nature of the patents, the Court finds that material factual disputes exist on AIA's motions on non-infringement, obviousness, and prior public use that are beyond the scope of this

1. The Parties

AIA designs, develops, manufactures, installs and services high chromium wear corrosion and abrasion resistant products for the cement, mining and thermal power generation industries. Among AIA's products are parts for machines that grind abrasive materials, such as rock and other hard abrasive substances. Among other things, these ceramic products contain certain combinations of metal oxides that are resistant to wear. AIA's products are sold under the Sintercast mark. AIA manufactures its Sintercast products at facilities in India, but Vega sells and distributes Sintercast products in the United States.

AIA's Sintercast products are ceramic grains that contain alumina/zirconia ceramic material purchased from Treibacher Schleifmittel, GmbH ("Treibacher"), an Austrian company. (Docket Entry No. 101, Exhibit 2 at 32-36; Exhibit 3, Carr Deposition at 66-63). Treibacher manufactures these grains in Germany and ships them directly to India or to either Antwerp or Belgium for later shipment to India. Id. at Exhibit 2 at 32-33; Exhibit 3, Carr Deposition at 63; Exhibit 4 at 76. AIA has made only one purchase of ceramic grains from Treibacher's warehouse in Niagara Falls, New York. Id. at Exhibit 3, Carr Deposition at 69-70 and 70-71. Vega negotiates the purchases of these ceramic grains with Treibacher's North American subsidiary. Id. at 62-63 and 66. Vega pays Treibacher for AIA. Id. Treibacher's ceramic grains purchased by Vega never reach the United States with the one exception. Id. at Exhibit 2 at 32-33 and at 47-48 (identifying the "Country of Origin" of ZK40 and ZZK40 as the "Federal Republic of Germany"); id. at Exhibit 3, Carr Deposition at 62-63 and at 70.

Magotteaux International was created in 1920 and owns foundries world-wide that

Memorandum. Thus, this section constitutes finding of facts under Fed. R. Civ. P. 56(d) only as to claims construction and recapture issues.

produce composite wear products that have resistant castings and media for grinding rock and abrasive materials. Magotteaux's customers include firms in the cement and mining industry, aggregates, the recycling industry, and power stations. These composite wear products are sold under the tradename Xwin. Magotteaux International owned the '176 patent and now owns the '998 reissued patent at issue under the name "Composite Wear Components." Magotteaux "Composite Wear Components" were produced under its former '176 patent and its current '998 patent. Magotteaux's wear products for the grinding process include high chromium content grinding media. In the United States market, Magotteaux provides grinding, linings, grinding diaphragms, rollers and tyres, hollow balls, as well as rings and grinding tables to fit vertical roller mills.

Magotteaux describes itself as an industry leader in technological innovations for developing industrial wear mechanisms and grinding processes. Magotteaux also uses alumina/zirconia ceramic grains products of Saint-Gobain as the material for its ceramic pad. Prior to Saint-Gobain, the Norton Company produced these materials. (Docket Entry No. 122, Van Kirk Declaration, Exhibit 7) (noting in an entry dated April 9, 1996 that Magotteaux had tested the composition of an alumina/zirconia ceramic composite identified as the "Norton Hagenburger" product).

Magotteaux manufactures and sells Xwin products using its own facilities and/or through related companies in various regions around the world. Magotteaux manufactures Xwin products at its facilities in Pulaski, Tennessee and Mexico, from which Magotteaux sells Xwin products in the United States, Canada, and Mexico. Magotteaux retained the right to sell Xwin products in the United States directly through subsidiaries. Other entities were allowed to sell Xwin in the United States. An internal Magotteaux "Executive News Letter" in 2001 announced

a supply agreement with a Spokane, Washington company for Xwin products. Id. at Exhibit 10 at 221 (M020804). This newsletter reported that the products “would be mainly manufactured in Magotteaux’s Pulaski and Monterrey [Mexico] and, perhaps, partially, in Europe if the overall economic situation allows for it (according to the future \$/Euro exchange rate).” Id.

AIA’s and Magotteaux’s dispute in this action of whether AIA’s wear component products infringe any valid and enforceable claim of Magotteaux’s ‘998 patent is not the parties’ first legal controversy. On March 24, 2008, Magotteaux filed a complaint before the International Trade Commission (“ITC”) alleging that AIA wear component products and Fonderie Acciaierie Roiale SPA (“FAR”)³ products infringed its ‘998 patent. In response to ITC’s investigation, AIA filed an action in India seeking an injunction against Magotteaux. In the India action, AIA was awarded an interim ex parte order barring Magotteaux from proceeding against AIA and Vega before the ITC, but did not require dismissal of the ITC proceedings. Based upon that order, AIA and Vega ceased their participation in the ITC proceeding. In November, 2008, an India appellate court dissolved that injunction and remanded for an evidentiary hearing. The India Supreme Court upheld that ruling in December 2008. On June 10, 2010, the ITC granted, in part, Magotteaux’s motion for default and sanctions for AIA’s failure to participate in the discovery process. (Docket Entry No. 167-4). The parties do not contend that either ruling is binding on this Court.

2. Magotteaux’s ‘176 Patent

The patents at issue here are the ‘176 and ‘998 patents that describe a wear component used in the crushing, grinding, or conveyance of abrasive materials that contains ceramic

³ Magotteaux also entered into a settlement agreement with FAR and another producer that included a limited license to sell products to embody the ‘998 patent in the United States. (Docket Entry No. 167-4, ITC Order at 2).

materials with a mixture of aluminum oxide, Al_2O_3 ("alumina") and zirconium oxide, ZrO_2 ("zirconia").

After initial review of Magotteaux's application for its original '176 patent, the United States Patent and Trademark ("USPTO") examiner rejected all of the Magotteaux's claims on several grounds, including anticipation and obviousness in light of the prior art. (Docket Entry No. 89-2 at 2-10). In response, Magotteaux submitted multiple materials to the USPTO examiner relying upon "solid solution" in Claim 1 limitation of the '176 patent to distinguish the proposed patent from prior art. Magotteaux construed Claim 1 for the '176 patent as follows:

Claim 1 can only be understood as meaning a cast product (working part) consisting of a (continuous) metal matrix including inserts which are ceramic pads which have been impregnated by the liquid metal during casting of the cast product. Thus, the metal will form, as usual, the cast product and the pads will include the same metal impregnated as such in the pads. In other words, due to the impregnation or infiltration, the metal matrix is not only continuous but also is included in the pads and is solid with these pads.

(Docket Entry No. 89-2 at 20).⁴

Magotteaux's counsel explained to the USPTO examiner that Magotteaux's invention was limited to ceramic pads and that "[a]s the application mentions on page 5, lines 4-17, the **invention is based on the observation that the ceramic pad must be a homogenous solid solution of $\text{Al}_2\text{O}_3/\text{ZrO}_2$.**" *Id.* at 79 (emphasis added). Magotteaux also submitted the declaration of Hubert Francois, the '176 patent inventor who described the claim for the solution of Al_2O_3 and ZrO_2 ceramics as follows:

5. In our invention *homogeneous solid solution of both ceramics meets the advantages of both Al_2O_3 and ZrO_2* without exhibiting the inconvenients: hot tearing and grain peeling. **An unexpected synergy is the result of this solid solution which exhibits better results than each single component contribution especially when embedded in the cast iron or steel matrix.**

⁴ The Court's citations are to the pagination in the electronic case filing system.

6. In practice, a lot of combinations of Al_2O_3 / ZrO_2 have been experienced by me and factors like expansion and shrinking, during the cooling phase, are of major importance in this field. The optimum proportions has been obtained empirically. **Only solid solutions of Al_2O_3 / ZrO_2 in proportions of 80/20 to 20/80 presents no "microspalling" effects.**

Id. at 12 (emphasis added). As to prior art, Magotteaux's counsel also stated that “[a]lthough the abstract (see: CONSTITUTION) mentions "alumina, high strength zirconia, etc." the text of the Japanese publication never refers to a $\text{Al}_2\text{O}_3/\text{ZrO}_2$, solid solution.” Id. at 22. Magotteaux further distinguished prior art in earlier patents because, “Solid solutions are not mentioned.” Id.⁵

The USPTO agreed with Magotteaux’s distinctions about the cited prior art and the ‘176 Patent issued shortly thereafter. On January 19, 1999, the USPTO examiner approved Magotteaux’s ‘176 patent with claim 1 of the ‘176 patent reading as follows:

Composite wear component produced by classical or centrifugal casting and **consisting of a metal matrix** having a working face or faces including inserts which have wear resistance, **the inserts consist of a porous ceramic pad, the porous ceramic pad consisting of a homogeneous solid solution of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of the constituents, and the porous ceramic pad being integrated into the metal matrix by impregnation of a liquid metal in the porous ceramic pad during the casting.**

(Docket Entry No. 89-1 at 16) (emphasis added).

⁵ AIA notes that the European patent authorities on Magotteaux's earlier European patent application also issued a patent with the same "solid solution" claim limitation below:

Wear parts of this type which are produced essentially by casting processes (i.e. using sand moulds) and incorporate ceramic wafer cores composed of a **homogeneous solid solution of Al_2O_3 , and ZrO_2 , are not obvious from the documents cited in the search report.**

(Docket Entry No. 89-3 at 4) (emphasis added).

The pertinent specifications in the '176 Patent that refer to "solid solution" or "ceramic composite" are as follows:

[The invention] consists of a metal matrix whose wear surface comprises inserts which have good abrasion resistance properties, these inserts being made of a **ceramic material, itself composite, consisting of a solid solution or homogeneous phase of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2** , the percentages being expressed by weights of constituents.

Column 2, line 55-61.

* * *

The content of ceramic materials in the insert is between 35 and 80% by weight this composite ceramic material is produced from an aggregate of ceramic grains which have a particle size within the range [of] F6 to F22 according to the FEPA standard These ceramic grains are manufactured in a conventional way, by electrofusion, by sintering, by flame spraying or by any other process allowing the two constituents to fuse.

Column 3, lines 10-17.

The choice of the proportions of the constituents of the composite ceramic insert may, of course, also take into account the composition of the casting metal with a view to the properties required by the application for which the component is intended.

Column 3, lines 65-68 – Column 4, lines 1-2.

A mixture of 75% of Al_2O_3 and 23% of ZrO_2 is made up, the two constituents of which are fused by electrofusion to form composite grains. . . . These grains are then poured into a mould of appropriate shape with a liquid adhesive which, after curing, holds the grains together to form a ceramic pad.

Column 4, lines 64-66 – Column 5, lines 1-3.

(Docket Entry No. 89-1 at 14-15) (emphasis added).

B. Magotteaux's '998 Patent

On May 30, 2003, Magotteaux applied to the PTO for a reissue patent. (Docket Entry No. 89-1 at 33). Significant here, this application substituted "ceramic composite" in claim 1 for "solid solution" and the term "comprising" for the phrase "consisting of" in a new independent

claim 12. (Docket Entry No 89-3 at 11 and Docket Entry No. 89-1 at 34-59). In its “REMARKS” in support of its application for a reissue patent, Magotteaux’s representative stated:

By this Preliminary Amendment, Applicant has added new claims 12-21. Claims 1-21 are pending in the application and claim 1 and 12 are independent.

Applicant verily believes the original patent to be wholly or partly invalid, by reason of the patentee claiming more or less than he had the right to claim in the patent. **By this Reissue Application, Applicant presents and intends to present claims that are, in at least some respects, broader than the claim in the issued patent.**

More particularly, at least one error upon which the reissue Application is based is that during prosecution of the application which issued on June 4, 2002 as U.S. Patent No. 6,399,176, the full scope of the invention was not appreciated, resulting in the Applicant having claimed less than they had a right to claim and rendering the patent wholly or partly inoperative. As an example of this error, the subject matter of claim 1 is narrower than what the Applicant had a right to claim. **Claim 1 was intended to include the possibility of the presence of other oxides, besides Al_2O_3 , whose proportion by weight does not exceed 3 to 4% (Column 2, lines 63-64). Limiting what was intended to be a ceramic pad with the possibility of the presence of other oxides, besides Al_2O_3 and ZrO_3 [sic], whose proportion by weight does not exceed 3 to 4%, unnecessarily and in error limited the scope of the Applicant’s invention, resulting in the Application having claimed less than they had a right to claim and rendering the patent wholly or partly inoperative.**

(Docket Entry No. 89-1 at 36-37) (emphasis added). In an attachment, Francois, the ‘176 patent inventor, stated about his error in the first application: “Claim 1 was intended to include the possibility of the presence of other oxides beside Al_2O_3 and ZrO_2 , whose proportion by weight does not exceed 3 to 4% (Column 2, lines 63-64).” *Id.* at 26. According to Francois, this “error limited the scope of my invention.” *Id.*

As in the ‘176 patent, Magotteaux’s composite wear component combines or mixes Al_2O_3 and ZrO_2 into composite ceramic grains. These composite ceramic grains are manufactured by electrofusion and sintering with flame spraying and other processes to allow the

two constituent chemicals to fuse. Once combined, the Al_2O_3 and ZrO_2 retain their crystal structure. A porous ceramic pad is formed by pouring the composite ceramic grains and an adhesive into a mold to hold the ceramic grains together. After curing, liquid metal is impregnated in the pad during casting to form the final composite wear component.

At the end of 2005 Magotteaux sought further revisions of its claims to replace the term ‘homogeneous solid solution’ with the term “homogeneous ceramic composite” in revised claim 1 and its new claim 12 stating:

1. (Currently amended) Composite wear component produced by classical or centrifugal casting and consisting of a metal matrix having a working face or faces including inserts which have wear resistance, wherein the inserts consist of a porous ceramic pad, the porous ceramic pad consisting of a **homogeneous ceramic composite [solid solution] of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of the constituents**, and the porous ceramic pad being integrated into the metal matrix by impregnation of a liquid metal in the porous ceramic pad during the casting.

* * *

12. (Currently amended) Composite wear component produced by classical or centrifugal casting, said composite wear component **comprising** a metal matrix having a working face or faces including inserts which have wear resistance, the inserts include a porous ceramic pad, **wherein [solid solution] of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2** , the percentages being expressed by weight of the constituents, and the porous ceramic pad being integrated into the metal matrix by impregnation of liquid metal in the porous ceramic pad during the casting.

(Docket Entry No. 89-3 at 11, 12) (emphasis added).

In its submission, Magotteaux explained that “support for the amendment of ‘solid solution’ to ‘homogeneous ceramic composite’ in claims 1 and 12 can be found at Col. 2, lines 58-61; Col. 3, lines 10 and 65-66; and Col. 4, lines 64-66” (Docket Entry No. 89-3 at 14) in the proposed ‘998 patent that read as follows:⁶

⁶ The Court has added language to provide context and given its uncertainty with the line numbers.

To meet the first objective the invention proposes a composite wear component produced by conventional or centrifugal casting. **It consists of a metal matrix whose wear surface comprises inserts which have good abrasion resistance properties, these inserts being made of a ceramic material itself composite, consisting of a solid solution or homogeneous phase** of 20 to 20% of Al₂O₃ and 80 to 20% ZrO₂, the percentages being expressed by weights of constituents.

Column 2, lines 58-65

* * *

23-27% by weight of ZrO₂

* * *

In the wear components which are subjected to strong abrasion it is advantageous to increase the proportion of aluminum oxide, not exceeding, however, a certain limit beyond which the abrasion resistance and the toughness begins to decrease.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1. Describes a composite wear component according to the first preferred embodiment of the present invention. *With FIG 1 being a sectional view*

(Docket Entry No. 89-1 at 14) (emphasis added).

During the prosecution of Magotteaux '998 Patent, a protest⁷ was filed with the USPTO arguing that the amended claims are unpatentable as an effort to recapture subject matter surrendered during the prosecution of Magotteaux's '176 Patent. This patent specifically cited Magotteaux's reliance on the term "solid solution" during prosecution of the original '176 patent application to make those claims allowable and such reliance precluded Magotteaux from substituting the term "ceramic composite" for the term "solid solution" in the claims of the reissue application. For this contention, the protest cited Magotteaux's counsel's statement and the Francois declaration quoted supra. The USPTO examiner denied the protest finding that the

⁷ Magotteaux identifies the protester as AIA, because some of the same challenges were presented. The USPTO ruling does not identify the protester. (Docket Entry No. 109-4 at 4-9).

change from “solid solution” to “ceramic composite” did not impermissibly alter the scope of the ‘176 patent. The USPTO examiner listed the protester’s objections and responded *in seriatim*, reasoning was follows:

- A. Claims 1 and 12 are barred under 35 U.S.C. 251 reciting “ceramic composite”.

* * *

However, while it is acknowledged that the declaration is made reference to in several instances in the cited Declaration, it would appear the reasoning the claims were found allowable over the art since the cited references for the reasons set forth in the fourth paragraph of the declaration. Furthermore, upon review of the specification and the method of forming the composite entails mixing and fusing the two materials, it is unclear how Applicant’s reference to this composite as a ‘solid solution’ would somehow limit the scope of the claims from any other combination of the claimed materials. As such, Protestor’s assertion that the reissue claim impermissibly attempts to recapture surrendered subject matter is not persuasive.

- B. Claim 12 is barred under 35 U.S.C. 251 for reciting “comprising”

* * *

However, as was set forth above, it appears the reasoning the claims were found allowable over the art was for the reasoning set forth in the fourth paragraph of the declaration. Furthermore, while the Declaration only makes reference to the compounds Al_2O_3 , Protesters assertion that Declaration clearly indicates the ceramic pads consist only of Al_2O_3 and ZrO_2 is not persuasive since the specification clearly teaches that other additives in addition to the claimed compounds may be included in the composite.

* * *

- A. Claim 12 is barred under 35 U.S.C. 112, first paragraph, for reciting “comprising”

* * *

Given the support specifically cited by Protestor in the specification, the limitation that of a porous ceramic pad comprising the claimed compounds is fully supported. As such, the assertion that claim 12 should be rejected under 35 U.S.C. 112, first paragraph, is not persuasive.

- B. The recitation of “35 and 80% by volume” introduces new matter into the specification and claims

* * *

However, when discussing a porous material which is to be subsequently filled or impregnated, one of ordinary skill in the art would typically refer to the amount of porous area that can be filled rather than the weights of the material filling the pores since the weight would vary depending on the materials selected for filling. The argument that one would not have recognized that appropriate correction is not persuasive since one of ordinary skill would recognize the correction would be to simply replace % by weight with % by volume.

III. THE CLAIMS ARE INVALID UNDER 35 U.S.C. 112, FIRST PARAGRAPH AS LACKING ENABLEMENT

* * *

Protestor argues that according to the specification shows unequivocally that an adhesive is necessary and thus claim 1 is invalid since it recites the pad consist of Al_2O_3 and ZrO_2 . Protestor cites the teaching in the specification in col. 3, lines 10-24 of an adhesive and states that since Applicant discloses no other way of aggregating the ceramic grains, an adhesive must be used.

This argument is not persuasive since Applicant does not ever teach that an adhesive is critical to the invention. Furthermore, Applicant need not teach every possible embodiment envisioned to established enablement. One of ordinary skill in the art would recognize that alternate methods of aggregating the grains could be employed with a reasonable expectation of success such as sintering the grains to form the composite porous pad. As such, Protestor’s assertion that the claims are not properly enabled is not persuasive.

(Docket Entry No. 109-4 at 5, 6, 7, 8).

In two of the above findings, the USPTO examiner cited paragraph 4 of Francois’s declaration as support for the allowance of the ‘176 patent despite prior art. Paragraph 4 of Francois’s affidavit reads as follows:

In the prior art, metal salts precursors [sic] are used to impregnate metal oxides (Larmie), in a preparation process for abrasive grains, used on abrasive machine tools. In Tamura[,] Akira and Wahl, no mention is made of any impregnation or infiltration. The particles are coated and not impregnated. **Furthermore, no solid solutions of Al_2O_3 / ZrO_2 are used. The use of pure Al_2O_3 leads to “hot tearing”, which means a crack appearing in the last sections of the casting to**

solidify in which constraints are present. This is due to differential thermal expansion of the metal and the ceramic padding. Pure Al_2O_3 padding leads to high hardness but, unfortunately, also high brittleness and fragility. The use of pure ZrO_2 increases the tenacity but decreases the resistance to wear because of low hardness.

(Docket Entry No. 89-2 at 11) (emphasis added).

The USPTO approved the issued '998 patent on January 8, 2008, with claim 12 of the issued '998 Patent containing the "solid solution" language of claim 1 of the '176 patent. Magotteaux then requested a certificate of correction, including claim 12 and changes to column 6, line 46 in its specifications of the '998 Patent. The first USPTO examiner rejected this request for replacement of "homogenous solid solution" with "homogenous ceramic composite", "since the change is not a typographical or grammatical error." (Docket Entry No. 89-3, Exhibit 8 at 133). Despite its examiner's questioning of the necessity for Magotteaux's request, the USPTO granted Magotteaux's request and issued a certificate of correction on July 22, 2008. (Docket Entry No. 109-1 at 10). The corrected reissue patent of January 8, 2008 contains the following language in claims 1 and 12:

1. Composite wear component produced by classical or centrifugal casting and consisting of a metal matrix having a working face or faces including inserts which have wear resistance, wherein the inserts consist of a porous ceramic pad, the porous ceramic pad consisting of a homogeneous ceramic composite of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of the constituents, and the porous ceramic pad being integrated into the metal matrix by impregnation of a liquid metal in the porous ceramic pad during the casting.

* * *

12. Composite wear component produced by classical or centrifugal casting, said composite wear component **comprising** a metal matrix having a working face or faces including inserts which have wear resistance, the inserts include a porous ceramic pad, wherein the porous ceramic pad **comprises a homogeneous ceramic composite of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of the constituents**, and the porous ceramic pad being integrated into the

metal matrix by impregnation of a liquid metal in the porous ceramic pad during the casting.

(Docket Entry No. 103-1 at 8) (emphasis added).

To support its construction of “homogeneous ceramic composite” here, Magotteaux cites several related claims in its ‘998 patent that provide as follows:

Claim 5

Composite wear component according to claim 1, wherein the inserts consist of an aggregate of composite ceramic grains which have a particle size within the range F6 to F22 according to the FEPA standard.

Claim 6

Composite wear component of claim 5, wherein the ceramic grains are manufactured by one of electronfusion, sintering and flame spraying.

Claim 7

Composite wear component of claim 5, wherein the ceramic grains are joined integrally with the aid of an inorganic or organic liquid adhesive prior to the casting of the liquid metal.

Claim 16

Composite wear component according to claim 12, wherein the inserts include an aggregate of composite ceramic grains which have a particle size within the range F6 to F22 according to the FEPA standard.

Id. In the ‘176 patent, Claims 6 and 7 refer to Claim 1, not Claim 5. (Docket Entry No. 89-1 at 16).

For further support of its definition of “ceramic composite”, Magotteaux cites the following specifications in its ‘998 patent:

To meet the first objective the invention proposes a composite wear component produced by conventional or centrifugal casting. It consists of a metal matrix whose wear surface comprises inserts which have good abrasion resistance properties, these inserts being made of a ceramic material, itself composite, consisting of a solid solution or homogeneous phase of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of constituents.

Column 2, lines 55-65.

This composite ceramic material is produced from an aggregate of ceramic grains which have a particle size within the range F6 to F22 according to the FEPA standard that is to say a diameter of between approximately 0.7 mm and 5.5 mm. These ceramic grains are manufactured in a conventional way, by electrofusion, by sintering, by flame spraying or by any other process allowing the two constituents to fuse.

The ceramic grains are aggregated with the aid of an adhesive, the proportion of which does not exceed 4% by weight relative to the total weight of the pad and is preferable between 2 and 3% by weight.

Column 3, lines 23-37.

The choice of the proportions of the constituents of the composite ceramic insert may, of course, also take into account the composition of the casting metal with a view to the properties required by the application for which the component is intended. Similarly, the choice of the composition of the casting metal may be adapted to the nature of the composite insert.

Column 4, lines 12-18.

(Docket Entry No. 103-1 at 6, 7). This language from Columns 2, 3 and 4 in the '998 patent are also in the '176 patent at Column 2, lines 53-62, Column 2, lines 10 to 21, and Column 3, line 65 – Column 4, line 4, respectively. *Id.* at 14, 15.

For other sources of proof on the construction of the key terms by one skilled in the art, AIA cites technical treatises on the meaning of terms “solid solution,” “homogeneous” and “phases.” As to the “homogeneous” and “phases” terms, AIA quotes a standard chemical dictionary that defines “homogeneous” as “uniform in composition and structure.” (Docket Entry No. 52-21, Concise Chemical and Technical Dictionary, 547 (H. Bennett ed.) (3rd ed. 1974)). Another technical definition that supports AIA’s construction and addresses the method for testing uniformity of composition reads as follows:

...The term [homogeneous] is loosely (but improperly) used to describe mixtures of two or more liquids which are uniformly dispersed in each other, so that samples taken at random have the same percentage composition ...

(Docket Entry No. 52-23, Glossary of Chemical Terms, 137 (Clifford A. Hampel and Gessner G. Hawley eds.) (Van Nostrand Reinhold Co., 1982)) (emphasis added).

AIA also cites a scientific review article on the scientific understanding of homogeneity in the field of phase and powder mixing,⁸:

It is very difficult to give a definition of homogeneity. Few authors continue to use this term. Fan *et al.* defined a homogeneous mixture as one in which the compositions of all constituents are uniform within the whole mixture. It is clear that the qualifying of the powder mixture will depend on the nature of the material and on the purpose required. The term homogeneity is not suitable and not sufficient to characterize a powder mixture. For example, it will mean different things for mixtures in the pharmaceutical and construction industries, and only has significance when associated to an appropriate scale.

(Docket Entry No. 52-5, Poux et al., Powder Technology, 68, 213-34 (1991)).

As to the term, “solid solution” AIA cites a trade treatise:

Pure metals are seldom used as compared to the alloys which are commonly used. Alloys are metallic solids, complex in composition and are formed as a result of solidification of molten liquid of two or more elements. An alloy normally has properties which are a compromise between these of its constituents and sometimes has properties, superior to and quite different from those of its constituents.

Alloys are a combination of a number of metals in a number of ways. One predominant form is solid solution. **A solution is formed when solute atoms are dissolved in solvent atoms.** Similar to the familiar liquid solutions, it is also feasible to have a solid solution. If a solution is allowed to freeze without separating the constituents, a solid solution would result. **In a solid solution the materials are present only as a mixture but not as chemical compound. The solid solutions are the essential part of an alloy.**

There are generally two types of solid solutions: one called the interstitial and the other the substitutional. In an interstitial solid solution, the solute atom would be positioned in the interstitial sites (empty space between the adjacent atoms) formed by the solvent atoms. It is possible only when the solvent atom is much

⁸ This paper is cited as relevant because according to the patent, the ceramic composite material is often formed through electrofusion, scientering, and flame spraying methods that commence with the mixing of two or more ceramic constituents. (Docket Entry No. 52-1, Exhibit 1, Column 3, lines 27-30).

larger compared to the solute atom. Also the extent of solubility depends on the difference in the atomic size. For example, carbon would form an interstitial solid solution with iron.

Carbon atomic radius = 0.0750 mm

Iron atomic radius = 0.2141 mm

Iron changes to an FCC structure above 720°C. If a carbon atom is placed in the FCC structure of iron at 730°C, the iron atoms are to be displaced by a distance of 0.0430 mm. In BCC structure at room temperature, if a carbon atom is to be located, the iron atoms are to be displaced by a distance of about 0.111 mm. Because of this distortion, iron at room temperature would only dissolve a maximum of 0.006% carbon. But above 730°C up to 2% carbon can be dissolved.

In the substitutional solid solutions, the solute atoms would replace the solvent atoms. This is only possible, if both the atoms are similar in size and also in nature.

(Docket Entry No. 59-2 at 6, 7) (emphasis added).

Of the Claims of the '998 patent, the following are the subjects of the parties' disputes on claim construction:

Claim	Term
1, 12, 13, 16, 17-21	(a) composite wear component
1	(b) consisting of
12	(c) comprising
1, 12, 20	(d) metal matrix
1, 12, 16	(e) inserts
1, 12, 19, 20	(f) a porous ceramic pad
1, 12	(g) homogeneous
1, 12	(h) ceramic composite
1, 12	(i) of 20 to 20% of Al_2O_3 80 to 20% of ZrO_2 , the percentages being expressed by weight
1, 12	(j) the constituents
1, 12	(k) impregnation

(Docket Entry No. 53-1 at 2-3). As discussed infra, some of these terms possess distinct legal meanings. The parties agree on the appropriate construction of some terms. Under

the rules of claims construction, the claims and specifications require some terms to be addressed collectively to discern their meanings under the claims, specifications of the patents, and the patents' prosecution history.

B. Conclusions of Law

1. Markman Claim Construction Rules

Under Markman, “the construction of a patent, including terms of art in its claim, is exclusively within the province of the court.” 517 U.S. at 372. The Supreme Court also cited its earlier precedent that considered “the description of the invention and specifications of claim annexed to them” and noted consideration of expert testimony. Id. at 384, 385. In an en banc decision, the Federal Circuit redefined the roles of different sources for claim construction in patent actions to reemphasize the importance of claims and their specifications. Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

It is a “bedrock principle” of patent law that “the claims of a patent define the invention to which the patentee is entitled the right to exclude.” Innova, 381 F.3d at 1115...Congress first required that the specification include a portion in which the inventor “shall particularly specify and point out the part, improvement, or combination, which he claims as his own invention or discovery.” Act of July 4, 1836, ch. 357, § 6, 5 Stat. 117, 119. [T]he Supreme Court made clear that the claims are “of primary importance, in the effort to ascertain precisely what it is that is patented.” Merrill v. Yeomans, 94 U.S. 568, 570, 24 L.Ed. 235 (1876).

* * *

We have frequently stated that the words of a claim “are generally given their ordinary and customary meaning.” Vitronics, 90 F.3d at 1582. . . . We have made clear, moreover, that the ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, *i.e.*, as of the effective filing date of the patent application.

* * *

The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation. . . .That starting point is . . . that inventors are typically persons skilled in the field of the

invention and that patents are addressed to and intended to be read by others of skill in the pertinent art.

In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words. . . . In such circumstances, general purpose dictionaries may be helpful. In many cases that give rise to litigation, however, determining the ordinary and customary meaning of the claim requires examination of terms that have a particular meaning in a field of art. Because the meaning of a claim term as understood by persons of skill in the art is often not immediately apparent, and because patentees frequently use terms idiosyncratically, the court looks to “those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean.” Innova, 381 F.3d at 1116. Those sources include “the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” Id.

* * *

Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claim terms.

* * *

Other claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment as to the meaning of a claim term. Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims. Differences among claims can also be a useful guide in understanding the meaning of particular claim terms. For example, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.

The claims, of course, do not stand alone . . . claims “must be read in view of the specification, of which they are a part.” Id. at 979. . . . [W]e stated in Vitronics, the specification “is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” 90 F.3d at 1582.

* * *

The close kinship between the written description and the claims is enforced by the statutory requirement that the specification describe the claimed invention in

“full, clear, concise, and exact terms.” 35 U.S.C. § 112, para. 1. . . .In light of the statutory directive that the inventor provide a “full” and “exact” description of the claimed invention, the specification necessarily informs the proper construction of the claims.

In addition to consulting the specification, we have held that a court “should also consider the patent's prosecution history, if it is in evidence.” Markman, 52 F.3d at 980. . . .The prosecution history, which we have designated as part of the “intrinsic evidence,” consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent. . . . Like the specification, the prosecution history provides evidence of how the PTO and the inventor understood the patent. . . .Yet because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes....

[W]e have also authorized district courts to rely on extrinsic evidence, which “consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” Markman, 52 F.3d at 980. . . .However, while extrinsic evidence “can shed useful light on the relevant art,” we have explained that it is “less significant than the intrinsic record in determining ‘the legally operative meaning of claim language.’” C.R. Bard, Inc. v. U.S. Surgical Corp., 388 F.3d 858, 862 (Fed. Cir. 2004).

Within the class of extrinsic evidence, the court has observed that dictionaries and treatises can be useful in claim construction. . . .We have especially noted the help that technical dictionaries may provide to a court “to better understand the underlying technology” and the way in which one of skill in the art might use the claim terms. Vitronics, 90 F.3d at 1584 n. 6. . . .Such evidence, we have held, may be considered if the court deems it helpful in determining “the true meaning of language used in the patent claims.” Markman, 52 F.3d at 980.

We have also held that extrinsic evidence in the form of expert testimony can be useful to a court for a variety of purposes, such as to provide background on the technology at issue, to explain how an invention works, to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field. . . .[A] court should discount any expert testimony “that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent.” Key Pharms., 161 F.3d at 716.

* * *

In effect, the Texas Digital approach limits the role of the specification in claim construction to serving as a check on the dictionary meaning of a claim term if the specification requires the court to conclude that fewer than all the dictionary definitions apply, or if the specification contains a sufficiently specific alternative definition or disavowal. . . . That approach, in our view, improperly restricts the role of the specification in claim construction.

Assigning such a limited role to the specification, and in particular requiring that any definition of claim language in the specification be express, is inconsistent with our rulings that the specification is “the single best guide to the meaning of a disputed term,” and that the specification “acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.” Vitronics, 90 F.3d at 1582.

* * *

Even technical dictionaries or treatises, under certain circumstances, may suffer from some of these deficiencies. There is no guarantee that a term is used in the same way in a treatise as it would be by the patentee. In fact, discrepancies between the patent and treatises are apt to be common because the patent by its nature describes something novel.

Moreover, different dictionaries may contain somewhat different sets of definitions for the same words. A claim should not rise or fall based upon the preferences of a particular dictionary editor, or the court's independent decision, uninformed by the specification, to rely on one dictionary rather than another.

As we have noted above, however, we do not intend to preclude the appropriate use of dictionaries. Dictionaries or comparable sources are often useful to assist in understanding the commonly understood meaning of words and have been used both by our court and the Supreme Court in claim interpretation. . . . A dictionary definition has the value of being an unbiased source “accessible to the public in advance of litigation.” Vitronics, 90 F.3d at 1585. . . .

To avoid importing limitations from the specification into the claims, it is important to keep in mind that the purposes of the specification are to teach and enable those of skill in the art to make and use the invention and to provide a best mode for doing so. . . . One of the best ways to teach a person of ordinary skill in the art how to make and use the invention is to provide an example of how to practice the invention in a particular case.

Id. at 1312-23.

The Federal Circuit has also considered applicants’ remarks from the prosecution history for claim construction. See IP Innovation, L.L.C. v. eCollege.com, 156 Fed. Appx. 317, 322

(Fed. Cir. 2005); see also TDM America, LLC v. United States, 85 Fed. Cl. 774 (Fed. Cl. 1992).

In addition to the specification, applicants' remarks can provide confirmation for appropriate claim construction. Astrazeneca AB, Aktiebolaget Hassle, KBI-E, Inc. v. Mutual Pharmaceutical Comp., Inc., 384 F.3d 1333, 1341 (Fed. Cir. 2004).

The parties' respective construction of the pertinent terms in the '176 patent are as follows:

<u>Claim Term/Phrase</u>	<u>Matotteaux's Proposed Claim Construction</u>	<u>AIAE's Proposed Claim Construction</u>
homogeneous	characterizes the nature of the mixture of at least Al ₂ O ₃ and ZrO ₂ and means an aggregation of relatively consistent grains of at least 20 to 80% Al ₂ O ₃ and 80 to 20% ZrO ₂ In the context of the asserted claims, "homogeneous" means "relatively consistent" at the level of the ceramic grains which make up the ceramic composite	indefinite; or, alternatively, of uniform composition within an arbitrarily sized volume sufficient to contain all of the pertinent elements or molecules present in the material, in any arbitrary location within that material, such that any compositional variations are no larger than those that would be obtained by evaluating samples of that sized volume from a statistically random mixture of the pertinent elements or molecules that make up the material
solid solution	not a claim term	as used in the specification, solid solution is equivalent to "homogeneous ceramic composite" a mixture of two or more types of molecules or atoms in the solid state wherein the minor component, the solute, is incorporated into the major component, the solvent, and the crystal structure of the solvent is maintained as the concentration of the solute is

		increased
consisting of	a closed end transitional phrase indicating that the claim includes only those elements, steps or ingredients specified in the claim and that the claim does not include any other elements, steps or ingredients	a term of exclusion; here, that the porous ceramic pad of Claim 1 may contain only a homogeneous ceramic composite of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of the constituents (as those terms are defined herein)
of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights	The material consisting of the two referenced oxides, in a percentage amount falling within the respective range total weight amount of Al_2O_3 and ZrO_2 in the porous ceramic pad	reference for each one, and having the same fixed percentages within any arbitrarily sized volume sufficient to contain all of the pertinent elements or molecules present in the material, in any arbitrary location within that material, such that any compositional variations are no larger than those that would be obtained by evaluating samples of that sized volume from a statistically random mixture of the pertinent elements or molecules that make up the materials in the porous ceramic pad, including but not limited to the Al_2O_3 and ZrO_2 of the constituents the materials in the porous ceramic pad, including but not limited to the Al_2O_3 and ZrO_2

Under Phillips, the rules of construction focus on the disputed claim and its specifications as to primary sources of construction. Applying Phillips, the Court's claim construction begins with the phrases "homogenous solid solution" in Claim 1 of the '176 patent, but includes the

pertinent language, “consisting of a porous ceramic pad, the porous ceramic pad consisting of a homogeneous solid solution of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of the constituents.” This construction of these collective terms is because during the prosecution of the ‘176 patent and after the USPTO’s examiner’s initial rejection, Magotteaux’s representatives cited this language as the critical distinction from the prior art, namely the ‘176 patent’s “homogenous solid solution.” The Court deems the construction of “homogenous” alone inappropriate.⁹ Consideration of the meaning of “homogenous” must be with the phrase “solid solution” because in describing its ‘176 patent, Claim 1 reads: “the inserts consist of a porous ceramic pad, the porous ceramic pad consisting of a homogeneous solid solution of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of the constituents.” The specifications in the ‘176 patent also contained the same language.

Column 2

To meet the first objective the invention proposes a composite wear component produced by conventional or centrifugal casting. It consists of a metal matrix whose wear surface comprises inserts which have good abrasion resistance properties, **these inserts being made of a ceramic material, itself composite, consisting of a solid solution or homogeneous phase of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of constituents.**

(Docket Entry No. 89-1 at 14).

Aside from this language in the claim and specifications, Francois, the inventor distinguished the ‘176 patent from the prior art referring to the unique feature of his invention the “homogeneous solid solution of both ceramics meets the advantages of both Al_2O_3 and ZrO_2 ,”

⁹ If separate consideration were necessary, the Court would adopt AIA’s construction of “homogenous” as more consistent with the original description in claim 1 and related specifications in the ‘176 patent.

and that an "unexpected synergy" resulted from this "solid solution," and that of the many combinations of Al_2O_3 and ZrO_2 , "[o]nly solid solutions of Al_2O_3 / ZrO_2 , in proportions of 80/20 to 20/80 presents no 'microspalling' effects." (Docket Entry No. 52-11, Francois Declaration at 2). Magotteaux's representative distinguished the Japanese patent cited by the USPTO examiner as prior art stating, "the text of the Japanese Publication never refers to a $\text{Al}_2\text{O}_3/\text{ZrO}_2$ solid solution" and, for good measure, that "[s]olid solutions are not mentioned." (Docket Entry No. 61-5 at 9) (emphasis added).

As a matter of law, the phrase "consisting of" in claim 1 and its related specification has a restrictive meaning under patent law precedents. In Vehicular Technologies Corp. v. Titan Wheel Intern., Inc., 212 F.3d 1377, 1382-1383 (Fed. Cir. 2000), the Federal Circuit defined "consisting of" and "comprising":

The phrase "consisting of" is a term of art in patent law signifying restriction and exclusion, while in contrast, the term "comprising" indicates an open-ended construction. In simple terms, **a drafter uses the phrase "consisting of" to mean "I claim what follows and nothing else."**

Id. at 1383 (emphasis added). In Norian Corp. v. Stryker Corp., 432 F.3d 1356, 1359 (Fed. Cir. 2005) the Federal Circuit held that the phrase "consisting of" in a claim for a water and sodium phosphate solution was limited to solutions that contained water and only a single solute, *i.e.*, a single type of sodium phosphate, not a mixture of different sodium phosphates. These decisions are not rules of construction subject to Phillips, but constitute substantive and binding patent law.

Considering these primary rules of claims construction and the governing patent law, the Court concludes that the phrase "homogeneous solid solution" in claim 1 and the related specification means that its composition is limited to "20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of the constituents," with no other solute present in the solid solution.

The next claim construction issue is whether "homogenous ceramic composite" in the '998 patent is synonymous with "homogeneous solid solution" in the '176 patent based on the language and histories of the '176 and '998 patents. As quoted earlier, Claim 1 of the '176 patent describes, in pertinent part, an invention by referring to "a homogeneous **solid solution** of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 ." (emphasis added). By contrast, reissue claim 1 and claim 12 of the '998 patent (after correction by the USPTO) both describe a ceramic constituent that is "a homogeneous **ceramic composite** of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 " and also use the new term "comprising" instead of "consisting of." (emphasis added). The parties' proposed constructions of this phrase and its terms are set forth below:

<u>Claim Term/Phrase</u>	<u>Matotteaux's Proposed Claim Construction</u>	<u>AIAE's Proposed Claim Construction</u>
homogeneous	characterizes the nature of the mixture of at least Al_2O_3 and ZrO_2 and means an aggregation of relatively consistent grains of at least 20 to 80% Al_2O_3 and 80 to 20% ZrO_2 In the context of the asserted claims, "homogeneous" means "relatively consistent" at the level of the ceramic grains which make up the ceramic composite	indefinite; or, alternatively, of uniform composition within an arbitrarily sized volume sufficient to contain all of the pertinent elements or molecules present in the material, in any arbitrary location within that material, such that any compositional variations are no larger than those that would be obtained by evaluating samples of that sized volume from a statistically random mixture of the pertinent elements or molecules that make up the material
ceramic composite	The mixture of at least, Al_2O_3 and ZrO_2	A material that is composed of two or more substances, at least two of which are ceramics, which in this case are Al_2O_3 and ZrO_2 in solid
homogenous ceramic composite	An aggregation of relatively consistent grains of at least 20	A ceramic composite (as defined above) that is

	to 80% of Al ₂ O ₃ and 80 to 20% of ZrO ₂	homogenous (as defined above)
--	----------------------------------------------------------------------------	-------------------------------

As to whether the “homogenous ceramic composite,” in the ‘998 patent claims 1 and 12 has the same meaning as “homogeneous solid solution,” the Court applies Phillips and examines the relevant claims and related specifications in the ‘998 patent:

1. Composite wear component produced by classical or centrifugal casting and consisting of a metal matrix having a working face or faces including inserts which have wear resistance, wherein the inserts consist of a porous ceramic pad, the porous ceramic pad consisting of a **homogeneous ceramic composite of 20 to 80% of Al₂O₃ and 80 to 20% of ZrO₂, the percentages being expressed by weights of the constituents**, and the porous ceramic pad being integrated into the metal matrix by impregnation of a liquid metal in the porous ceramic pad during the casting.

* * *

12. Composite wear component produced by classical or centrifugal casting, said composite wear component **comprising** a metal matrix having a working face or faces including inserts which have wear resistance, the inserts include a porous ceramic pad, wherein the porous ceramic pad comprises a **homogeneous ceramic composite** of 20 to 80% of Al₂O₃ and 80 to 20% of ZrO₂, the percentages being expressed by weights of the constituents, and the porous ceramic pad being integrated into the metal matrix by impregnation of a liquid metal in the porous ceramic pad during the casting.

(Docket Entry No. 89-1 at 8) (emphasis added).

To support its definition of “ceramic composite,” Magotteaux cites several related claims in its ‘998 patent:

Claim 5

Composite wear component according to claim 1, wherein the inserts consist of an aggregate of composite ceramic grains which have a particle size within the range F6 to F22 according to the FEPA standard.

Claim 6

Composite wear component of claim 5, wherein the ceramic grains are manufactured by one of electronfusion, sintering and flame spraying.

Claim 7

Composite wear component of claim 5, wherein the ceramic grains are joined integrally with the aid of an inorganic or organic liquid adhesive prior to the casting of the liquid metal.

Claim 16

Composite wear component according to claim 12, wherein the inserts include an aggregate of composite ceramic grains which have a particle size within the range F6 to F22 according to the FEPA standard.

Id. In Magotteaux's '176 patent, claims 6, and 7 referred to Claim 1, not Claim 5 as in the '998 patent. Id. at 16.

For further support of its definition of "ceramic composite," Magotteaux also cites the following specifications in its '998 patent:

To meet the first objective the invention proposes a composite wear component produced by conventional or centrifugal casting. It consists of a metal matrix whose wear surface comprises inserts which have good abrasion resistance properties, **these inserts being made of a ceramic material, itself composite, consisting of a solid solution or homogeneous phase of 20 to 80% of Al_2O_3 and 80 to 20% of ZrO_2 , the percentages being expressed by weights of constituents.**

Column 2, lines 55-65.

This composite ceramic material is produced from an aggregate of ceramic grains which have a particle size within the range F6 to F22 according to the FEPA standard that is to say a diameter of between approximately 0.7 mm and 5.5 mm. These ceramic grains are manufactured in a conventional way, by electrofusion, by sintering, by flame spraying or by any other process allowing the two constituents to fuse.

The ceramic grains are aggregated with the aid of an adhesive, the proportion of which does not exceed 4% by weight relative to the total weight of the pad and is preferable between 2 and 3% by weight.

Column 3, lines 23-37.

The choice of the proportions of the constituents of the composite ceramic insert may, of course, also take into account the composition of the casting metal with a view to the properties required by the application for which the component is intended. Similarly, the choice of the composition of the casting metal may be adapted to the nature of the composite insert.

Column 4, lines 12-18.

(Docket Entry No. 61, Magotteaux Brief at 8; Docket Entry No. 89-1 at 6, 7). This language from Columns 2, 3 and 4 in the '998 patent are also in the '176 patent at Column 2 lines 53-62, Column 2 lines 10 to 21 and Column 3 line 65 to Column 4 line 4, respectively. Id. at 14, 15.

In its construction of “ceramic composite,” Magotteaux describes this phrase as “the mixture of at least Al_2O_3 and ZrO_2 ” (Docket Entry No. 531, Markman Brief at 21), but subsequently Magotteaux defined this phrase as “the mixture of at least Al_2O_3 and ZrO_2 , wherein each of the Al_2O_3 and ZrO_2 retains a distinct composition and/or crystal structure” (Docket Entry No 61, Markman Brief at 6-12). Magotteaux defined “composite” as “a material that is a mixture or combination of **two or more materials, each of which as and retains a distinct composition and/or crystal structure.**” Id. at 19. AIA responds that under Magotteaux's proposed construction, the word “mixture” and the phrase “at least” suggest that homogeneous ceramic composite could include more than two chemicals and may not be solid solution.

From the Court's research, the term “composite”¹⁰ has not acquired a distinctive meaning under patent law precedents, but a closely related phrase “composed of” in a patent claim was defined as follows: “We hold that the words ‘composed of’ is regarded as synonymous with ‘consisting of’ that has a restrictive definition.” In re Bertsch, 132 F.2d 1014, 1019 (Cust. &

¹⁰ In related fields of intellectual property law, such as the Copyright Act and trademark law, a “composite work” has been construed to a work “comprised of distinct products.” Rexnord, Inc. v. Modern Handling Systems, Inc., 379 F.Supp. 1190, 1195 (D. Del. 1974) and a “composite mark” is a mark that incorporates separate words, phrases and/or designs to yield a single mark. In re Save Venice New York, 259 F.3d 1346, 1352-55 (Fed. Cir. 2001).

Patent App. 1942). To be sure, a district court stated that “the words ‘composed of’ may under certain circumstances be given, a broader meaning than ‘consisting of.’” Engineering, Inc. v. Mason, Inc., 2009 WL 755321 at *6 (S.D. Cal. March 9, 2009) (quoting Bertsch on extrinsic evidence that expert opinion may reveal a “particularly open construction” of this term). Yet, Phillips emphasizes the claim and specifications as the primary sources.

Under Federal Circuit precedents, with the use of the phrase “consisting of” in Claim 1 and the specifications in the ‘176 patent, the substitution of the claim limitation “homogenous ceramic composite,” for the former “homogenous solid solution,” coupled with the term “comprising” in claims 1 and 12 of the ‘998 patent, the Court concludes that Magotteaux expanded its patent beyond Claim 1 in the ‘176 patent. This conclusion is consistent with Magotteaux’s remarks about its application for the ‘998 reissued patent: “By this Reissue Application, Applicant presents and **intends to present claims that are, in at least some respects, broader than the claim in the issued patent.**” (Docket Entry No. 89-1 at 36) (emphasis added). The ‘176 patent inventor’s explained that without this reissued patent and its expanded definition, the ‘176 patent “limited the scope of my invention.” Id. at 26. The Court’s conclusion that the ‘998 patent broadened the claim under the ‘176 patent does not end the analysis.

2. Recapture

Under 35 U.S.C. § 251, a patentee may obtain reissue of a patent, if through error, the patent is “deemed wholly or partly inoperative or invalid, by reason of the patentee claiming more or less than he had a right to claim in the patent....” See also 37 C.F.R. § 1.175. The recapture rule serves dual purposes: first, to prevent the patenting of unpatentable claims by barring the reissue of subject matter that was already abandoned because the rendered claims

were obvious or anticipated by the prior art. See MBO Laboratories, Inc. v. Becton, Dickinson & Co., 474 F.3d 1323 (Fed. Cir. 2007). Second, the recapture rule protects the interests of the public who "are on notice of the surrender and may have come to rely on the consequent limitations on claim scope." Id. "The public's reliance interest provides a justification for the recapture rule that is independent of the likelihood that the surrendered territory was already covered by prior art or otherwise unpatentable." Id. The reissue procedure does not give the patentee "a second opportunity to prosecute de novo his original application." Mentor Corp. v. Coloplast, Inc., 998 F.2d 992, 995 (Fed. Cir. 1993).

"Claims that are broader than the original patent claims in a manner directly pertinent to subject matter surrendered during prosecution are impermissible." Medtronic, Inc. v. Guidant Corp., 465 F.3d 1360, 1372 (Fed. Cir. 2006). Surrender of recaptured subject matter necessarily depends on the facts in each case, Mentor Corp. v. Caloplast, Inc., 998 F.2d 992, 995 (Fed. Cir. 1997), and must be established by clear and convincing evidence. Kim v. ConAgra Foods, Inc., 465 F.3d 1312, 1322 (Fed. Cir. 2006). Under the "recapture" rule, where during the prosecution of the original patent application a patent applicant relies upon specific subject matter to overcome a prior art rejection, the patent applicant thereby surrenders unclaimed subject matter that cannot be recouped through the reissue process. Pannu v. Storz Inst., Inc., 258 F.3d 1366, 1371 (Fed. Cir. 2001); Hester Indus., Inc. v. Stein, Inc., 142 F.3d 1472, 1479-80 (Fed. Cir. 1998) ("[A] surrender is not the type of correctable 'error' contemplated by the reissue statute.").

Moreover, "if the reissue claim is as broad as or broader in an aspect germane to a prior art rejection, but narrower in another aspect **completely unrelated to** the rejections, the recapture rule bars the claim." In re Clement, 131 F.3d 1464, 1470 (Fed. Cir. 1997) (emphasis added). A reissue claim that does not include a limitation present in the original patent claims is

broaden in that respect. Hester, 142 F.3d at 1480. If the claims of a reissue patent violate the recapture rule, then the claims are invalid. Id.

In sum, to determine whether a reissued patent is invalid under the recapture doctrine, the Federal Circuit established a three-step test:

- (1) Whether the reissue claims are broader than the original patent claims and the extent of the expansion.
- (2) Whether the broader aspects of the reissued claims relate to subject matter surrendered during the prosecution of the original patent application.
- (3) If there are also narrower aspects of the reissue claims, invalidity may only be avoided if: (a) the narrower aspects also relate to the surrendered subject matter and, if so, (b) the reissue claims are, on balance, narrower than the original claims in a manner directly pertinent to the surrendered subject matter.

Clement, 131 F.3d at 1468-69.

To determine whether an applicant surrendered particular subject matter, the Federal Circuit examines the "prosecution history for arguments and changes to the claims made in an effort to overcome a prior art rejection." Clement, 131 F.3d at 1469 (citations omitted). In the Federal Circuit, arguments to the USPTO to overcome a prior art rejection alone can demonstrate the surrender of subject matter. Hester, 142 F.3d at 1481 ("Arguments made to overcome prior art can equally evidence an admission sufficient to give rise to a finding of surrender."). "There is no unfairness in binding the patentee to deliberate assertions made in order to obtain allowance of the original patent claims over the prior art. Indeed, fairness to the public must also be considered. . . . [T]he reissue statute cannot be construed in such a way that competitors, properly relying on prosecution history, become patent infringers when they do so." Id. (citations omitted). "[I]f the objective public observer can discern a surrender of subject matter during the prosecution of an original patent in order to overcome prior art and obtain the patent, then the

recapture rule should prevent the reissuing of that patent to claim the surrendered subject matter." Yoon Ja Kim v. ConAgra Foods, Inc., 465 F.3d 1312, 1323 (Fed. Cir. 2006).

Under this "objective public observer" standard, Magotteaux's position before the USPTO for its '176 application was that the term "solid solution" was the key element in claim 1 of the '176 patent that distinguished the '176 patent from the prior art. In Hester, the patentee obtained a reissue patent that deleted two specific claim limitations and "argued that each of the[] limitations was 'critical' with regard to patentability," and the Federal Circuit held the reissue patent to constitute a surrender. 142 F.2d at 1478. Here, Magotteaux's argument and the inventor's statements were that the "homogeneous solid solution" distinguished its '176 patent to overcome the prior art. Based upon Hester and these undisputed facts, the Court concludes that by its reliance on the "homogeneous solid solution" to overcome prior art, Magotteaux surrendered any claim to products that contain "homogenous ceramic composites" that were not within the scope "the homogenous solid solution" in the original '176 patent. The '176 patent limited the invention to certain ranges of only two chemical components that the '998 patent attempts to increase. "[I]f the reissue claim is as broad as or broader in an aspect germane to a prior art rejection . . . the recapture rule bars the claim." Clement, 131 F.3d at 1468

The Court also notes that in reissue claim 12 in the '998 patent, Magotteaux employed the term "comprising," an expansive term of art, rather than "consisting of" in the original claim 1 of the '176 patent. As a matter of substantive patent law, this difference broadens the original claim 1 because "comprising" allows reissue claim 12 to include additional compounds beyond the two chemical elements identified in the '176 patent. Magotteaux's proposed construction of "homogeneous" describes all ceramic composites or any other "mixture" of Al_2O_3 and ZrO_2 and also as a "mixture of at least Al_2O_3 and ZrO_2 ." In Claim 12 of the '998 patent, Magotteaux's

ceramic pad includes up to 4% of a ceramic other than Al_2O_3 and ZrO_2 because that claim uses the expansive term “comprising.”


Magotteaux’s construction of the “20/80” term in the ‘998 patent does not provide a measurable means to determine the weights of Al_2O_3 and ZrO_2 so as to avoid infringement. “Ceramic composite” under Magotteaux’s proposed definition would include any mixture of Al_2O_3 and ZrO_2 , regardless of whether that mixture is a solid solution. Magotteaux’s construction of “homogeneous ceramic composite” is that the mixture need only be “relatively consistent.” During its prosecution of the ‘176 patent in distinguishing prior art, Magotteaux expressly surrendered ceramic materials that do not form a solid solution with the two listed chemicals in stated proportions. In the Court’s view, the terms in the ‘998 patent of “relatively consistent” and a “mixture of at least Al_2O_3 and ZrO_2 ,” render it difficult for a person skilled in the art to know how to avoid infringing the patent’s claims. “[T]he patent holder must distinctly claim his invention so that competitors will be on notice of the scope of the patent holder’s rights.” Athletic Alternatives, 73 F.3d at 1581. See also Energizer Holdings, 435 F.3d at 1370; Ethicon Endo-Surgery, 93 F.3d at 1581.

For these reasons, the Court concludes that Magotteaux’s claims 1 and 12 in the ‘998 patent impermissibly recapture subject matter that Magotteaux surrendered in its ‘176 patent. Claims 1 and 12 also expand Magotteaux’s patent right to cover a broad and to some extent undefined group of products beyond the scope of its ‘176 patent. With these conclusions, the Court deems consideration of the parties’ other contested patent terms and contentions to be unnecessary.

Accordingly, the Plaintiff's motions for summary judgment (Docket Entry Nos. 88 and 97) should be granted and the Plaintiff's other motions for summary judgment (Docket Entry Nos. 10, 116, 118 and 120) should be denied without prejudice as moot.

An appropriate Order is filed herewith.

ENTERED this the 3rd day of September, 2010.


WILLIAM J. HAYNES, JR.
United States District Judge